

Claims:

1. A device for atomizing and comminuting liquid melts, including a slag tundish to whose outlet an expansion or cooling chamber is connected, whereby a propellant gas lance opens into the outlet, which propellant gas lance is surrounded by a tubular underflow weir immersed in the liquid slag, characterized in that the width of the gap between the lower edge of the underflow weir (3) and the tundish bottom (5) is smaller than 20%, preferably smaller than 15%, of the clear width (D) of the outlet (8), that the bottom (5) of the tundish (6) in the region between the lower edge of the overflow weir (3) and the outlet (8) is designed in a funnel-shaped manner, and that the propellant gas lance (1) is configured for the use of supercritical vapor to form an underexpanded free jet (11) in the interior of the melt jet, the flow speed at the nozzle mouth of the lance (1) being adjusted to sonic speed.

2. A device according to claim 1, characterized in that the angle of inclination α of the funnel-shaped tundish bottom region (5) is chosen to be smaller than 30°, preferably approximately 20°, relative to the cross sectional plane of the outlet (8).

3. A device according to claim 1 or 2, characterized in that the tundish (6) comprises heating elements (15) to heat with medium-frequency current, and that at least the underflow weir (3) is made of an electrically conductive material such as, e.g., C, SiC, ZrO₂ or ZrO₂.MgO.

4. A device according to claim 1, 2 or 3, characterized in that the outlet region (8) of the tundish (6) is made of SiC, Al₂O₃, ZrO₂ and/or ZrO₂.MgO.

5. A device according to any one of claims 1 to 4, characterized in that the tundish (6) is made of graphite or SiC.

6. A device according to any one of claims 1 to 5, characterized in that the propellant gas lance (1) is designed for a propellant vapor having a temperature of between 600° and 1250°C at a pressure ranging between 2 and 5 bars.

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7. A device according to any one of claims 1 to 6, characterized in that the slag outlet (8) of the tundish (6), following the funnel-shaped inlet, is designed to be hollow-conical or cylindrical over an axial length corresponding to 0.6 to 1.1 times the clear diameter (D) of the outlet (8).

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8. A device according to claim 7, characterized in that the outlet (8) widens conically following the hollow-conical or cylindrical region.

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9. A method for atomizing and comminuting liquid melts using a device according to any one of claims 1 to 8, characterized in that a supercritical vapor is injected through the propellant gas lance to form an underexpanded free jet in the interior of the melt jet with the flow speed at the nozzle mouth of the lance being adjusted to sonic speed.

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10. A method according to claim 9, characterized in that a propellant vapor having a temperature of between 600° and 1250°C at a pressure ranging between 2 and 5 bars is used.

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11. A method according to claim 9 or 10, characterized in that fluxes such as, e.g., CaF_2 are added to liquid slags to enhance their rheologic properties.

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